



## SEQUENCE LISTING

(1) GENERAL INFORMATION:

5 (i) APPLICANT: Jardieu, Paula M.  
Presta, Leonard G.

(ii) TITLE OF INVENTION: Humanized Anti-CD11a Antibodies

10 (iii) NUMBER OF SEQUENCES: 71

(iv) CORRESPONDENCE ADDRESS:  
(A) ADDRESSEE: Genentech, Inc.  
(B) STREET: 1 DNA Way  
(C) CITY: South San Francisco  
(D) STATE: California  
(E) COUNTRY: USA  
(F) ZIP: 94080

20 (v) COMPUTER READABLE FORM:  
(A) MEDIUM TYPE: 3.5 inch, 1.44 Mb floppy disk  
(B) COMPUTER: IBM PC compatible  
(C) OPERATING SYSTEM: PC-DOS/MS-DOS  
(D) SOFTWARE: WinPatin (Genentech)

(vi) CURRENT APPLICATION DATA:  
 (A) APPLICATION NUMBER:  
 (B) FILING DATE: 19-SEP-03  
 (C) CLASSIFICATION:

(vii) PRIOR APPLICATION DATA:  
(A) APPLICATION NUMBER: 60/031971  
(B) FILING DATE: 27-NOV-1996

35 (vii) PRIOR APPLICATION DATA:  
(A) APPLICATION NUMBER: 08/974899  
(B) FILING DATE: 20-NOV-1997

(vii) PRIOR APPLICATION DATA:  
40 (A) APPLICATION NUMBER: 09/420745  
(B) FILING DATE: 20-OCT-1999

(vii) PRIOR APPLICATION DATA:  
 (A) APPLICATION NUMBER: 09/975798  
 (B) FILING DATE: 28-FEB-2001

(viii) ATTORNEY/AGENT INFORMATION:  
(A) NAME: Tan, Lee K.  
(B) REGISTRATION NUMBER: 39,447

(C) REFERENCE/DOCKET NUMBER: P1014R1C1D1C1

(ix) TELECOMMUNICATION INFORMATION:

(A) TELEPHONE: 650/225-4462

(B) TELEFAX: 650/952-9881

5 (2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 108 amino acids

10 (B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

15 Asp Val Gln Ile Thr Gln Ser Pro Ser Tyr Leu Ala Ala Ser Pro  
1 5 10 15

Gly Glu Thr Ile Ser Ile Asn Cys Arg Ala Ser Lys Thr Ile Ser  
20 25 30

20 Lys Tyr Leu Ala Trp Tyr Gln Glu Lys Pro Gly Lys Thr Asn Lys  
35 40 45

Leu Leu Ile Tyr Ser Gly Ser Thr Leu Gln Ser Gly Ile Pro Ser  
50 55 60

25 Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile  
65 70 75

30 Ser Ser Leu Glu Pro Glu Asp Phe Ala Met Tyr Tyr Cys Gln Gln  
80 85 90

His Asn Glu Tyr Pro Leu Thr Phe Gly Thr Gly Thr Lys Leu Glu  
95 100 105

35 Leu Lys Arg

(2) INFORMATION FOR SEQ ID NO:2:

40 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 108 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

45 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val  
1 5 10 15

	Gly	Asp	Arg	Val	Thr	Ile	Thr	Cys	Arg	Ala	Ser	Lys	Thr	Ile	Ser	
					20					25					30	
	Lys	Tyr	Leu	Ala	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	Lys	
					35					40					45	
5	Leu	Leu	Ile	Tyr	Ser	Gly	Ser	Thr	Leu	Gln	Ser	Gly	Val	Pro	Ser	
					50					55					60	
	Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	
10					65					70					75	
	Ser	Ser	Leu	Gln	Pro	Glu	Asp	Phe	Ala	Thr	Tyr	Tyr	Cys	Gln	Gln	
					80					85					90	
15	His	Asn	Glu	Tyr	Pro	Leu	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Val	Glu	
					95					100					105	
	Ile	Lys	Arg													

20

(2) INFORMATION FOR SEQ ID NO:3:

	(i) SEQUENCE CHARACTERISTICS:
	(A) LENGTH: 108 amino acids
25	(B) TYPE: Amino Acid
	(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

30	Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Ser	Leu	Ser	Ala	Ser	Val	
	1				5					10					15	
	Gly	Asp	Arg	Val	Thr	Ile	Thr	Cys	Arg	Ala	Ser	Gln	Ser	Ile	Ser	
					20					25					30	
35	Asn	Tyr	Leu	Ala	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	Lys	
					35					40					45	
	Leu	Leu	Ile	Tyr	Ala	Ala	Ser	Ser	Leu	Glu	Ser	Gly	Val	Pro	Ser	
40					50					55					60	
	Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	
					65					70					75	
45	Ser	Ser	Leu	Gln	Pro	Glu	Asp	Phe	Ala	Thr	Tyr	Tyr	Cys	Gln	Gln	
					80					85					90	
	Tyr	Asn	Ser	Leu	Pro	Trp	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Val	Glu	
					95					100					105	

Ile Lys Arg

(2) INFORMATION FOR SEQ ID NO:4:

- 5 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 121 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY: Linear

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Glu Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Met Arg Pro Gly  
1 5 10 15  
Ala Ser Val Lys Leu Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr  
20 25 30  
Gly His Trp Met Asn Trp Val Arg Gln Arg Pro Gly Gln Gly Leu  
35 40 45  
20 Glu Trp Ile Gly Met Ile His Pro Ser Asp Ser Glu Thr Arg Leu  
50 55 60  
Asn Gln Lys Phe Lys Asp Lys Ala Thr Leu Thr Val Asp Lys Ser  
25 65 70 75  
Ser Ser Ser Ala Tyr Met Gln Leu Ser Ser Pro Thr Ser Glu Asp  
80 85 90  
30 Ser Ala Val Tyr Tyr Cys Ala Arg Gly Ile Tyr Phe Tyr Gly Thr  
95 100 105  
Thr Tyr Phe Asp Tyr Trp Gly Gln Gly Thr Thr Leu Thr Val Ser  
110 115 120  
35 Ser

(2) INFORMATION FOR SEQ ID NO:5:

- 40 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 121 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY: Linear

45 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly  
1 5 10 15

	Gly	Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Tyr	Ser	Phe	Thr	
					20					25					30	
	Gly	His	Trp	Met	Asn	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	
					35					40					45	
5	Glu	Trp	Val	Gly	Met	Ile	His	Pro	Ser	Asp	Ser	Glu	Thr	Arg	Tyr	
					50					55					60	
	Asn	Gln	Lys	Phe	Lys	Asp	Arg	Phe	Thr	Ile	Ser	Val	Asp	Lys	Ser	
10					65					70					75	
	Lys	Asn	Thr	Leu	Tyr	Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	
					80					85					90	
15	Thr	Ala	Val	Tyr	Tyr	Cys	Ala	Arg	Gly	Ile	Tyr	Phe	Tyr	Gly	Thr	
					95					100					105	
	Thr	Tyr	Phe	Asp	Tyr	Trp	Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	
					110					115					120	
20	Ser															

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 113 amino acids  
 (B) TYPE: Amino Acid  
 (D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

	Glu	Val	Gln	Leu	Val	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	
	1				5					10					15	
35	Gly	Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	
					20					25					30	
	Ser	Tyr	Ala	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	
40					35					40					45	
	Glu	Trp	Val	Ser	Val	Ile	Ser	Gly	Asp	Gly	Gly	Ser	Thr	Tyr	Tyr	
					50					55					60	
45	Ala	Asp	Ser	Val	Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	
					65					70					75	
	Lys	Asn	Thr	Leu	Tyr	Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	
					80					85					90	

Thr Ala Val Tyr Tyr Cys Ala Arg Gly Phe Asp Tyr Trp Gly Gln  
95 100 105

Gly Thr Leu Val Thr Val Ser Ser  
110

5

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:

10

(A) LENGTH: 184 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

15

Lys Gly Asn Val Asp Leu Val Phe Leu Phe Asp Gly Ser Met Ser  
1 5 10 15

Leu Gln Pro Asp Glu Phe Gln Lys Ile Leu Asp Phe Met Lys Asp  
20 25 30

20

Val Met Lys Lys Leu Ser Asn Thr Ser Tyr Gln Phe Ala Ala Val  
35 40 45

25

Gln Phe Ser Thr Ser Tyr Lys Thr Glu Phe Asp Phe Ser Asp Tyr  
50 55 60

Val Lys Arg Lys Asp Pro Asp Ala Leu Leu Lys His Val Lys His  
65 70 75

30

Met Leu Leu Leu Thr Asn Thr Phe Gly Ala Ile Asn Tyr Val Ala  
80 85 90

Thr Glu Val Phe Arg Glu Glu Leu Gly Ala Arg Pro Asp Ala Thr  
95 100 105

35

Lys Val Leu Ile Ile Ile Thr Asp Gly Glu Ala Thr Asp Ser Gly  
110 115 120

Asn Ile Asp Ala Ala Lys Asp Ile Ile Arg Tyr Ile Ile Gly Ile  
125 130 135

40

Gly Lys His Phe Gln Thr Lys Glu Ser Gln Glu Thr Leu His Lys  
140 145 150

45

Phe Ala Ser Lys Pro Ala Ser Glu Phe Val Lys Ile Leu Asp Thr  
155 160 165

Phe Glu Lys Leu Lys Asp Leu Phe Thr Glu Leu Gln Lys Lys Ile  
170 175 180

Tyr Val Ile Glu

(2) INFORMATION FOR SEQ ID NO:8:

- 5 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 184 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY: Linear

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

	Lys	Gly	Asn	Val	Asp	Leu	Ile	Phe	Leu	Phe	Asp	Gly	Ser	Met	Ser	
	1				5					10					15	
15	Leu	Gln	Pro	Asp	Glu	Phe	Gln	Lys	Ile	Leu	Asp	Phe	Met	Lys	Asp	
					20					25					30	
	Val	Met	Lys	Lys	Leu	Ser	Asn	Thr	Ser	Tyr	Gln	Phe	Ala	Ala	Val	
					35					40					45	
20	Gln	Phe	Ser	Thr	Ser	Tyr	Lys	Thr	Glu	Phe	Asp	Phe	Ser	Asp	Tyr	
					50					55					60	
	Val	Lys	Gln	Lys	Asp	Pro	Asp	Ala	Leu	Leu	Glu	His	Val	Lys	His	
25					65					70					75	
	Met	Leu	Leu	Leu	Thr	Asn	Thr	Phe	Gly	Ala	Ile	Asn	Tyr	Val	Ala	
					80					85					90	
30	Thr	Glu	Val	Phe	Arg	Glu	Glu	Leu	Gly	Ala	Arg	Pro	Asp	Ala	Thr	
					95					100					105	
	Lys	Val	Leu	Ile	Ile	Ile	Thr	Asp	Gly	Glu	Ala	Thr	Asp	Ser	Gly	
					110					115					120	
35	Asn	Ile	Asp	Ala	Ala	Lys	Asp	Ile	Ile	Arg	Tyr	Ile	Ile	Gly	Ile	
					125					130					135	
	Gly	Lys	His	Phe	Gln	Thr	Lys	Glu	Ser	Gln	Glu	Thr	Leu	His	Lys	
40					140					145					150	
	Phe	Ala	Ser	Lys	Pro	Ala	Ser	Glu	Phe	Val	Lys	Ile	Leu	Asp	Thr	
					155					160					165	
45	Phe	Glu	Lys	Leu	Lys	Asp	Leu	Phe	Thr	Glu	Leu	Gln	Lys	Lys	Ile	
					170					175					180	

Tyr Ala Ile Glu

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 7 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Lys His Val Lys His Met Leu

1

5

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 10 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

Gly Tyr Ser Phe Thr Gly His Trp Met Asn

1

5

10

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

Met Ile His Pro Ser Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe

1

5

10

15

Lys Asp

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 12 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Gly Ile Tyr Phe Tyr Gly Thr Thr Tyr Phe Asp Tyr

1

5

10



(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 11 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

Arg Ala Ser Lys Thr Ile Ser Lys Tyr Leu Ala

1

5

10

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 7 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

Ser Gly Ser Thr Leu Gln Ser

1

5

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 9 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

Gln Gln His Asn Glu Tyr Pro Leu Thr

1

5

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 11 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Pro Lys Asn Ser Ser Met Ile Ser Asn Thr Pro

1

5

10

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 7 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

His Gln Ser Leu Gly Thr Gln

1

5

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 8 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

His Gln Asn Leu Ser Asp Gly Lys

1

5

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 8 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

His Gln Asn Ile Ser Asp Gly Lys

1

5

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 8 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Val Ile Ser Ser His Leu Gly Gln

1

5

(2) INFORMATION FOR SEQ ID NO:21:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: Nucleic Acid
- (C) STRANDEDNESS: Single
- (D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

CACTTTGGAT ACCGCGTCCT GCAGGT 26

(2) INFORMATION FOR SEQ ID NO:22:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: Nucleic Acid
- (C) STRANDEDNESS: Single
- (D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

CATCCTGCAG GTCTGCCTTC AGGTCA 26

(2) INFORMATION FOR SEQ ID NO:23:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 amino acids
- (B) TYPE: Amino Acid
- (D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Met Ile Ala Pro Ala Ser Ser Ser Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15

Lys Asp

(2) INFORMATION FOR SEQ ID NO:24:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 121 amino acids
- (B) TYPE: Amino Acid
- (D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

1      5      10      15  
Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly  
5      20      25      30  
Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Tyr Ser Phe Thr  
35      40      45  
Gly His Trp Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu  
10      50      55      60  
Glu Trp Val Gly Met Ile Ala Pro Ala Ser Ser Ser Thr Arg Tyr  
65      70      75  
15      80      85      90  
Asn Gln Lys Phe Lys Asp Arg Phe Thr Ile Ser Val Asp Lys Ser  
95      100      105  
20      110      115      120  
Thr Ala Val Tyr Tyr Cys Ala Arg Gly Ile Tyr Phe Tyr Gly Thr  
125  
25      130  
Thr Tyr Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser  
135  
25      140  
Ser

(2) INFORMATION FOR SEQ ID NO:25:

30  
(i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 10 amino acids  
    (B) TYPE: Amino Acid  
    (D) TOPOLOGY:

35      (xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

1      5      10  
Gly Tyr Ser Phe Thr Gly His Trp Met Asn

40      (2) INFORMATION FOR SEQ ID NO:26:

45      (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 10 amino acids  
    (B) TYPE: Amino Acid  
    (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Gly Tyr Ala Phe Ala Gly Ala Trp Met Asn  
1 5 10

5 (2) INFORMATION FOR SEQ ID NO:27:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10 amino acids  
(B) TYPE: Amino Acid  
10 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

15 Gly Tyr Ala Phe Thr Gly His Trp Met Asn  
1 5 10

(2) INFORMATION FOR SEQ ID NO:28:

20 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

25 Gly Tyr Ser Phe Ala Gly His Trp Met Asn  
1 5 10

(2) INFORMATION FOR SEQ ID NO:29:

30 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10 amino acids  
(B) TYPE: Amino Acid  
35 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

40 Gly Tyr Ser Phe Thr Ala His Trp Met Asn  
1 5 10

(2) INFORMATION FOR SEQ ID NO:30:

45 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

Gly Tyr Ser Phe Thr Gly Ala Trp Met Asn  
1 5 10

5 (2) INFORMATION FOR SEQ ID NO:31:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10 amino acids  
(B) TYPE: Amino Acid  
10 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

15 Gly Tyr Ser Phe Thr Gly His Ala Met Asn  
1 5 10

(2) INFORMATION FOR SEQ ID NO:32:

20 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

25 Met Ile His Pro Ser Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15

30 Lys Asp

(2) INFORMATION FOR SEQ ID NO:33:

35 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

40 Met Ile Ala Pro Ala Asp Ala Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15

45 Lys Asp

(2) INFORMATION FOR SEQ ID NO:34:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

Met Ile His Pro Ser Ala Ser Ala Thr Ala Tyr Asn Gln Lys Phe  
1 5 10 15  
Lys Asp

(2) INFORMATION FOR SEQ ID NO:35:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

Met Ile Ala Pro Ala Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15  
Lys Asp

(2) INFORMATION FOR SEQ ID NO:36:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

Met Ile His Pro Ala Asp Ala Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15  
Lys Asp

(2) INFORMATION FOR SEQ ID NO:37:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

5 Met Ile Ala Pro Ser Asp Ala Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15  
Lys Asp

10 (2) INFORMATION FOR SEQ ID NO:38:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
15 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

20 Met Ile Ala Pro Ser Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15  
Lys Asp

25 (2) INFORMATION FOR SEQ ID NO:39:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
30 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

35 Met Ile Ser Pro Ser Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15  
Lys Asp

40 (2) INFORMATION FOR SEQ ID NO:40:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
45 (D) TOPOLOGY:



(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

Met Ile His Pro Ala Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15  
Lys Asp

(2) INFORMATION FOR SEQ ID NO:41:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

Met Ile His Pro Ser Ala Ser Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15  
Lys Asp

(2) INFORMATION FOR SEQ ID NO:42:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

Met Ile His Pro Ser Asp Ala Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15  
Lys Asp

(2) INFORMATION FOR SEQ ID NO:43:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

Met Ile His Pro Ser Asp Asn Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15

Lys Asp

(2) INFORMATION FOR SEQ ID NO:44:

- 5 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

- 10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

Met Ile His Pro Ser Asp Gln Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15

- 15 Lys Asp

(2) INFORMATION FOR SEQ ID NO:45:

- 20 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

- 25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

Met Ile His Pro Ser Asp Ser Ala Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15

- 30 Lys Asp

(2) INFORMATION FOR SEQ ID NO:46:

- 35 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

- 40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

Met Ile His Pro Ser Asp Ser Glu Thr Ala Tyr Asn Gln Lys Phe  
1 5 10 15

- 45 Lys Asp

(2) INFORMATION FOR SEQ ID NO:47:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

Met Ile His Pro Ser Asp Ser Glu Thr Arg Tyr Asn Ala Lys Phe  
1 5 10 15

Lys Asp

(2) INFORMATION FOR SEQ ID NO:48:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

Met Ile His Pro Ser Asp Ser Glu Thr Arg Tyr Asn Gln Ala Phe  
1 5 10 15

Lys Asp

(2) INFORMATION FOR SEQ ID NO:49:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

Met Ile His Pro Ser Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15

Ala Asp

(2) INFORMATION FOR SEQ ID NO:50:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

5 Met Ile His Pro Ser Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe  
1 5 10 15  
Lys Ala

10

(2) INFORMATION FOR SEQ ID NO:51:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 11 amino acids  
15 (B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

20 Gly Ile Tyr Phe Tyr Gly Thr Thr Tyr Phe Asp  
1 5 10

(2) INFORMATION FOR SEQ ID NO:52:

25 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 11 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

30 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

Gly Ile Ala Phe Ala Gly Thr Thr Tyr Phe Asp  
1 5 10

35 (2) INFORMATION FOR SEQ ID NO:53:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 11 amino acids  
(B) TYPE: Amino Acid  
40 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

45 Gly Ile Tyr Phe Tyr Gly Ala Ala Ala Phe Asp  
1 5 10

(2) INFORMATION FOR SEQ ID NO:54:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 11 amino acids
- (B) TYPE: Amino Acid
- (D) TOPOLOGY:

5 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

Gly Ile Ala Phe Tyr Gly Thr Thr Tyr Phe Asp  
 1 5 10

10 (2) INFORMATION FOR SEQ ID NO:55:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 11 amino acids
  - (B) TYPE: Amino Acid
  - (D) TOPOLOGY:

15

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

20 Gly Ile Tyr Phe Ala Gly Thr Thr Tyr Phe Asp  
 1 5 10

(2) INFORMATION FOR SEQ ID NO:56:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 11 amino acids
  - (B) TYPE: Amino Acid
  - (D) TOPOLOGY:

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

30

Gly Ile Tyr Phe Tyr Gly Ala Thr Tyr Phe Asp  
 1 5 10

(2) INFORMATION FOR SEQ ID NO:57:

35

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 11 amino acids
  - (B) TYPE: Amino Acid
  - (D) TOPOLOGY:

40

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

Gly Ile Tyr Phe Tyr Gly Thr Ala Tyr Phe Asp  
 1 5 10

45

(2) INFORMATION FOR SEQ ID NO:58:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 11 amino acids

(B) TYPE: Amino Acid  
(D) TOPOLOGY:

5 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

Gly Ile Tyr Phe Tyr Gly Thr Thr Ala Phe Asp  
1 5 10

10 (2) INFORMATION FOR SEQ ID NO:59:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 11 amino acids  
(B) TYPE: Amino Acid  
15 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

20 Arg Ala Ser Lys Thr Ile Ser Lys Tyr Leu Ala  
1 5 10

(2) INFORMATION FOR SEQ ID NO:60:

25 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 11 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

30 Arg Ala Ser Ala Ala Ile Ala Ala Tyr Leu Ala  
1 5 10

(2) INFORMATION FOR SEQ ID NO:61:

35 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 7 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

Ser Gly Ser Thr Leu Gln Ser  
1 5

45 (2) INFORMATION FOR SEQ ID NO:62:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 7 amino acids

(B) TYPE: Amino Acid  
(D) TOPOLOGY:

5 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

Ala Gly Ala Ala Leu Gln Ser  
1 5

10 (2) INFORMATION FOR SEQ ID NO:63:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 7 amino acids  
(B) TYPE: Amino Acid  
15 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

20 Ala Gly Ser Thr Leu Gln Ser  
1 5

(2) INFORMATION FOR SEQ ID NO:64:

25 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 7 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:64:

30 Ser Gly Ala Thr Leu Gln Ser  
1 5

(2) INFORMATION FOR SEQ ID NO:65:

35 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 7 amino acids  
(B) TYPE: Amino Acid  
40 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:65:

45 Ser Gly Ser Ala Leu Gln Ser  
1 5

(2) INFORMATION FOR SEQ ID NO:66:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 9 amino acids

(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:66:

5 Gln Gln His Asn Glu Tyr Pro Leu Thr  
1 5

(2) INFORMATION FOR SEQ ID NO:67:

10 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 9 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

15 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:67:

Gln Gln His Ala Ala Ala Pro Leu Thr  
1 5

20 (2) INFORMATION FOR SEQ ID NO:68:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 9 amino acids  
(B) TYPE: Amino Acid  
25 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:68:

30 Gln Gln Ala Asn Glu Tyr Pro Leu Thr  
1 5

(2) INFORMATION FOR SEQ ID NO:69:

35 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 9 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:69:

40 Gln Gln His Ala Glu Tyr Pro Leu Thr  
1 5

(2) INFORMATION FOR SEQ ID NO:70:

45 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 9 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:



(xi) SEQUENCE DESCRIPTION: SEQ ID NO:70:

5 Gln Gln His Asn Ala Tyr Pro Leu Thr  
1 5

(2) INFORMATION FOR SEQ ID NO:71:

10 (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 9 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:71:

15 Gln Gln His Asn Glu Ala Pro Leu Thr  
1 5